

ANTIBACTERIAL ACTIVITY OF JOSHANDA: A POLYHERBAL THERAPEUTIC AGENT USED IN COMMON COLD

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ABSTRACT

Joshanda which, a polyherbal preparation is extensively used by masses as a household remedy for treatment of common cold and found very effective. Our results indicated that *Zizyphus jujuba* (Unnab), *Onosma bracteatum* (Gaozaban) and *Glycyrrhiza glabra* (Mulethi) have significant degree of *invitro* activity against *Staph.aureus* while *Cordia latifolia* (Sapistan) has got a significant *invitro* activity against *H.influenzae*. Other ingredients did not show any significant activity against rest of the organisms tested.

INTRODUCTION

Under Unani systems of medicine agents based on plants and herbs have been used over centuries for various ailments and their therapeutic properties are well known. Taking into consideration this factor, the WHO has been emphasizing their wider use in order to improve the health care system. It is particularly true for developing countries, where ever-increasing cost of medicine is beyond the reach of common man. Furthermore allopathic medicines always show mild to serve side effects (Said, 1996; Chan, 1993).

The modern day scientific techniques have proven benefits of herbal drugs. Biological, physiological, pharmacological and toxological experimentation thus have exhibited value in certain ailments and diseases (Alam *et al.*, 1999).

Common cold is the most prevalent illness known to mankind. It has been reported that about 25% of population experiences 4-5 episodes of infections every year, 50% suffers 2-3 attacks and the remaining 25% suffers 0-1 infections per year (Wright, 1971). Such diseases of wide prevalence are not taken very

seriously by the patients and the incidence of self treatment is very high. Obviously self medication with herbal decoctions like Joshanda formulations should be considered safer as compared to attempts at self medication with modern common cold remedies.

“Joshanda” is a Persian word which means “prepared by boiling”. Unani crude drugs are mostly used in this form which are their aqueous extracts containing some water soluble organic principles and mostly inorganic ion compounds.

The most frequently used formulation of Joshanda comprises seven ingredients (Vohora, 1986).

1.	<i>Althea officinalis</i> (Khatmi) seeds	6 Gms.
2.	<i>Cordia latifolia</i> (Sapistan) dried fruit	5 Gms.
3.	<i>Glycyrrhiza glabra</i> (Mulethi) dried rhizomes	3 Gms.
4.	<i>Malva rotundifolia</i> (Khubbazi) seeds	6 Gms.
5.	<i>Onosma bracteatum</i> (Gaozaban) leaves	3 Gms.
6.	<i>Viola odorata</i> (Banafsha) flowers	4 Gms.
7.	<i>Zizyphus jujuba</i> (Unnab) dried fruit	6 Gms.

MATERIALS AND METHODS

Preparation of media and reagents

Most of the dehydrated media of Merck Germany were used. Media prepared were used for the storage of culture on slopes and poured in Petri dishes for culture and sensitivity of organisms.

Nutrient agar

Preparation – 4g of dehydrated nutrient broth powder (Merk 1.05443) was dissolved in 500 ml of distilled water taken in a conical flask. The nutrient broth medium was then incorporated with 9g of agar agar powder (Merk 1.01614) mixed thoroughly and heated while stirring. The medium was then autoclaved at 121°C for 15 minutes. Plates and tubes were then aseptically poured and left aside at room temperature for 24 hours to check any contamination and growth. The medium plates and tubes were then kept in a refrigerator till use.

Brain Heart Infusion agar medium

500 ml of distilled water was taken in a conical flask, 18.5g of dehydrated Brain Heart Infusion Broth (Merk 1.10493) was added to it and mixed thoroughly to dissolve completely. 10g of agar agar powder (Merk 1.01614) was added to Brain Heart Solution and heated while stirring, till the agar powder dissolved completely. The media autoclaved at 121°C for 15 minutes. Plates and tubes were aseptically poured by the media and kept at room temperature for 24 hours to check any contamination and growth. The sterile medium plates and tubes were kept in refrigerator till use.

Preparation of 1/1000 stock solution of Sodium Thiomersalate

Preparation – 0.1 gm (100 mg) sodium thiomersalate (merk) was dissolved in 100ml distilled water and kept in a glass bottle at room temperature till required. This solution was used to keep the herbal extracts sterile.

Final concentration – 1/10,000.

Identification and storage of pure culture for sensitivity test

Colonies of *Staphylococcus aureus*, *Haemophilus influenzae*, *Diphtheroids*, *Streptococcus pyogenes* and *Streptococcus pneumoniae* were collected from microbiology lab of Hamdard College of Medicine and Dentistry. After identification, the pure cultures were streaked on nutrient agar plates for drug sensitivity test.

Preparation of individual herb extracts used in “Joshanda”

Individual herb was boiled with 200 ml of distilled water in a conical flask, till the water reduced to 100ml. The extract was then filtered through filter paper in a sterilized bottle. This made a 50% extract of the herb.

9 ml of the extract and 1 ml of the stock solution of sodium thiomersalate were mixed together in a bottle. Sodium thiomersalate acts as a preservative. The solution was autoclaved for 20 minutes and then stored at 4°C in a refrigerator till use. This process was repeated for each individual component. Extract of herbs were diluted with distilled water to make 25%.

The anti microbial activity of individual components of Joshanda was determined by agar well diffusion method (Akaniro *et al.*, 1990). One loop full of bacteria culture was spread on the surface of each nutrient agar plates. Two wells were made in each plate with the help of pre-sterilized stainless steel cylinder of 10 mm diameter.

50 and 25% concentration of aqueous extracts of *Althea officinalis* (Khatmi), *Cordia latifolia* (Khubbazi), *Onosma bracteatum* (Gaozaban), *Viola odorata* (Banafsha) and *Zizyphus jujuba* (Unnab) were put separately in well no. 1 of each agar plate with the help of a fine dropper. Well no. 2 was filled with sterile distilled water which acted as a control. These plates were incubated at 37°C for 24 hours. Each experiment was carried out in triplicate and zone of inhibition formed was measured in m.m and recorded in the table (Akaniro *et al.* 1990).

RESULTS

Five different species of bacteria were subjected to antibacterial activity of the components of Joshanda. Results are summarized in Table.

Onosma bracteatum (Gaozaban)

50% aqueous extract of *Onosma bracteatum* was found to exhibit significant activity against *Staphylococcus aureus*. The zone of inhibition measured was 25mm, while the 25% extract showed an inhibitory zone of 20mm.

The extract did not show any antibacterial activity against *H.influnzae*, *Diphtheroids*, *Strep. pyogenes* and *Strep. Pneumoniae*.

Zizyphus jujuba (Unnab)

50% aqueous extract of *Zizyphus jujuba* was found to be moderately active with an inhibitory zone of 15 m.m only against *Staph.aureus* while 25% extract showed no inhibitory activity.

Cordia latifolia (Sapistan)

50% extract of *Cordia latifolia* showed a significant activity only against *H.influenzae*, making a zone of inhibition measuring 15mm in diameter.

Glycyrrhiza glabra (Mulethi)

Only 50% aqueous extract of *Glycyrrhiza glabra* showed an activity only against *Staph aureus*. The zone of inhibition measured was 14 mm in diameter.

Althaea officinalis (Khatmi), *Viola odorata* (Banafsha) and *Malva rotundifolia* (Khubbazi) didn't show any antibacterial activity against the organisms tested.

DISCUSSION

Herbs since time immemorial have been in use being remedies for various diseases inclusive of infective and contagious types. Common cold has been treated with success using a combination of individual herbs collectively known as Joshanda in Unani

Table

Antibacterial activity of aqueous extracts of herbs used in joshanda against certain bacterial species associated with common cold

Organism Tested	Extract Cone. %	Effective Zone of Inhibition in mm.							Control H ₂ O
		<i>Onosma baetatum</i> (Gaozaban)	<i>Zizyphus jujuba</i> (Unnab)	<i>Cordia latifolia</i> (Sapistan)	<i>Althaea Officinalis</i> (khatmi)	<i>Glycyrrhiza glabra</i> (Mulethi)	<i>Viola Odorata</i> (Banafsha)	<i>Malva rotundifolia</i> (Khubbazi)	
<i>Staph. aureus</i>	50	25	15	00	00	14	00	00	00
	25	20	00	00	00	00	00	00	00
<i>H. injluenzae</i>	50	00	00	20	00	00	00	00	00
	25	00	00	15	00	00	00	00	00
<i>Diphtheroids</i>	50	00	00	00	00	00	00	00	00
	25	00	00	00	00	00	00	00	00
<i>Strep. pyogenes</i>	50	00	00	00	00	00	00	00	00
	25	00	00	00	00	00	00	00	00
<i>Sterp. pneumoniae</i>	50	00	00	00	00	00	00	00	00
	25	00	00	00	00	00	00	00	00

System of Medicine. The clinical picture of common cold is manifestation of biological activities of a collection of both virus/viruses and bacteria. Present study mainly relates with those bacteria which are commonly associated with common cold with one role or another.

Commonly throat inhabiting bacteria were chosen to study whether or not they were inhibited *invitro* by individual constituents of Joshanda. Table-1 indicates the results of antibacterial action of individual herbs on selected bacteria.

The result indicated that *Onosma bracteatum*, *Zizyphus jujuba*, *Cordia latifolia* and *Glycyrrhiza glabra* extracts exhibited antibacterial activity in the general sense, where the rest of the lot did not have any such activity.

It is to note that *Onosma Bracteatum* (Gaozaban) demonstrated maximum activity against *Staph.aureus*, *Zizyphus jujuba* (Unnab) also had similar action but in higher concentration (50%). *Glycyrrhiza Glabra* (Mulethi) showed some activity against *Staph.aureus*. *Cordia latifolia* (Sapistan) exhibited activity against *H. influnzae*.

The most significant finding in this study was that the extended heat treatment at 100 °C didn't impair the antibacterial action of the components. No antibiotic in the present day use can stand that heat treatment, to retain its antibacterial property.

It would be of significance if such heat stable yet biologically active components are purified and characterized.

The studies on purified antibacterial components and their cumulative action might indicate and elucidate their efficacy as future remedies with a possible commercial exploitation.

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